

## Claims:

1. A method for processing tandem connection monitoring information in a synchronous hierarchic network system, comprising:
  - (a) receiving at a network element a frame containing tandem connection monitoring information associated with a plurality of tandem connection trails having trail terminations at the network element; and
  - (b) extracting from the frame the associated tandem connection monitoring information for each of the plurality of tandem connection trails having trail terminations at the network element prior to processing the tandem connection monitoring information for any of the tandem connection trails having trail terminations at the network element.
2. The method of claim 1 including processing the extracted tandem connection monitoring information associated with the tandem connection trails in parallel.
3. The method of claim 1 wherein the tandem connection monitoring information associated with each of the tandem connection trails includes trail trace identification information.
4. The method of claim 3 wherein the trail trace information is broken up for transmission over a number of successive frames and includes source access point identifier information identifying a source of the tandem connection monitoring information.
5. The method of claim 1 wherein the tandem connection monitoring information associated with each of the tandem connection trails includes a Bit-Interleaved Parity-8 (BIP-8) code computed at the source of each of the tandem connection trails based on payload information in a previously sent frame.

0998788.1.1601

6. The method of claim 1 wherein the tandem connection monitoring information associated with each of the tandem connections trails includes status bits carrying information indicating upstream conditions.

7. The method of claim 1 wherein the number of tandem connection monitoring terminations at the network element is from two to six.

8. The method of claim 1 wherein the frame includes a plurality of sub-fields each dedicated to carrying the tandem connection monitoring information associated with a pre-determined tandem connection monitored trail.

9. A network element configured to be connected in a synchronous hierarchic network and receive signals containing tandem connection monitoring information associated with a plurality of tandem connection monitoring terminations occurring at the network element, and further configured to extract from the received signals, independently for each of the tandem connection monitoring terminations occurring at the network element, the tandem connection monitoring information associated therewith.

10. The network element of claim 10 wherein the network element is configured to extract the tandem connection monitoring information prior to any modification of data included in the received signals.

11. The network element of claim 10 wherein the received signals include frames having predetermined overhead locations dedicated to the tandem connection monitoring information.

12. The network element of claim 10 further configured to monitor in parallel the extracted tandem connection monitoring information associated with tandem

00987788.111601

13. In a synchronous hierarchical network having multiple levels of tandem connection monitoring, a method comprising the steps of:

(b) processing at the network element the first tandem connection monitoring information in parallel with the second tandem connection information.

15. The method of claim 14 wherein the tandem connection monitoring information associated with each of the tandem connection monitoring trails includes trail trace identification information.

16. The method of claim 15 wherein the trail trace information is broken up for transmission over a number of successive frames and includes source access point identifier information identifying a source of the tandem connector monitoring information.